

WHAT IS CLAIMED IS:

1 1. A method for enabling access to data, comprising:
2 receiving a call from a client to invoke a remote interface method;
3 accessing, with a remote interface implementation, parameters from the received call in
4 response to the invocation of the remote interface method;
5 generating a stored procedure call with the accessed parameters as input parameters of
6 the stored procedure;
7 transferring the stored procedure call to a stored procedure named by the call to
8 execute;
9 receiving output from the stored procedure;
10 inserting the received output from the stored procedure into a data object; and
11 returning the data object to the client.

1 2. The method of claim 1, wherein the stored procedure executes in a database
2 server and generates the output, wherein the output is capable of comprising output that is a
3 member of the set of output comprising one or more result sets of data from the database table
4 and one or more output parameters resulting from stored procedure operations performed on
5 data in the database table.

1 3. The method of claim 1, further comprising processing, with the remote interface
2 implementation, an input mapping to determine the parameters in the client call to use as input
3 parameters to the stored procedure call.

1 4. The method of claim 1, further comprising:
2 receiving the stored procedure output after the stored procedure program completes
3 execution.

1 5. The method of claim 1, further comprising processing an output mapping
2 indicating how the stored procedure output is mapped to the data object.

1 6. The method of claim 5, wherein the output is capable of including result sets
2 and parameters, wherein the output mapping indicates an order in which the received result sets
3 and parameters are added to the data object

1 7. The method of claim 1, further comprising:
2 generating metadata describing the stored procedure output included in the data object;
3 and
4 adding the metadata to the data object.

1 8. The method of claim 7, further comprising:
2 processing, with the client, the metadata in the received data object to determine how
3 to access the stored procedure output from the data object.

1 9. The method of claim 7, wherein the data object is comprised of multiple
2 elements, wherein the stored procedure output includes rows of data from at least one result
3 set, wherein inserting the stored procedure output into the data object further comprises
4 inserting data from each column in each row in each result set to one element in the data object,
5 and wherein the metadata defines structure and types of data in each element.

1 10. The method of claim 7, wherein the data object is comprised of multiple
2 elements, and wherein the stored procedure output is capable of including multiple output
3 parameters, wherein inserting the stored procedure output into the data object further
4 comprises inserting each output parameter into one element in the data object, and wherein the
5 metadata provides information on structure and type of the data in each element.

1 11. The method of claim 1, wherein the client only receives one data object with
2 stored procedure output in response to the call.

1 12. The method of claim 1, wherein the remote interface implementation is
2 implemented as a Enterprise JavaBean and wherein the data object comprises a Java
3 serializable object.

1 13. A method for making stored procedure programs available to application
2 programs, comprising:
3 determining one stored procedure program generating output needed by one
4 application program;
5 generating a remote interface implementation to respond to a remote interface method
6 capable of receiving a call from the application program including data and invoking a stored
7 procedure in a database server with the data from the application program used as input; and
8 generating an output mapping for the remote interface implementation to use to
9 determine how to insert the stored procedure output into a data object that may be used by the
10 application program.

1 14. The method of claim 13, wherein the generated remote interface implementation
2 inserts metadata into the data object providing information on the stored procedure output
3 inserted into the data object.

1 15. A system for enabling access to data, comprising:
2 means for receiving a call from a client to invoke a remote interface method;
3 means for accessing, with a remote interface implementation, parameters from the
4 received call in response to the invocation of the remote interface method;

1 means for generating a stored procedure call with the accessed parameters as input
2 parameters of the stored procedure;
3 means for transferring the stored procedure call to a stored procedure named by the
4 call to execute;
5 means for receiving output from the stored procedure;
6 means for inserting the received output from the stored procedure into a data object;
7 and
8 means for returning the data object to the client.

1 16. The system of claim 15, wherein the stored procedure executes in a database
2 server and generates the output, wherein the output is capable of comprising output that is a
3 member of the set of output comprising one or more result sets of data from the database table
4 and one or more output parameters resulting from stored procedure operations performed on
5 data in the database table.

1 17. The system of claim 15, further comprising means for processing, with the
2 remote interface implementation, an input mapping to determine the parameters in the client call
3 to use as input parameters to the stored procedure call.

1 18. The system of claim 15, further comprising:
2 means for receiving the stored procedure output after the stored procedure program
3 completes execution.

1 19. The system of claim 15, further comprising means for processing an output
2 mapping indicating how the stored procedure output is mapped to the data object.

1 20. The system of claim 19, wherein the output is capable of including result sets
2 and parameters, wherein the output mapping indicates an order in which the received result sets
3 and parameters are added to the data object

1 21. The system of claim 15, further comprising:
2 means for generating metadata describing the stored procedure output included in the
3 data object; and
4 means for adding the metadata to the data object.

1 22. The system of claim 21, further comprising:
2 means for processing, with the client, the metadata in the received data object to
3 determine how to access the stored procedure output from the data object.

1 23. The system of claim 21, wherein the data object is comprised of multiple
2 elements, wherein the stored procedure output includes rows of data from at least one result
3 set, wherein the means for inserting the stored procedure output into the data object further
4 inserts data from each column in each row in each result set to one element in the data object,
5 and wherein the metadata defines structure and types of data in each element.

1 24. The system of claim 21, wherein the data object is comprised of multiple
2 elements, and wherein the stored procedure output is capable of including multiple output
3 parameters, wherein the means for inserting the stored procedure output into the data object
4 further inserts each output parameter into one element in the data object, and wherein the
5 metadata provides information on structure and type of the data in each element.

1 25. The system of claim 15, wherein the client only receives one data object with
2 stored procedure output in response to the call.

1 26. The system of claim 15, wherein the remote interface implementation is
2 implemented as a Enterprise JavaBean and wherein the data object comprises a Java
3 serializable object.

1 27. A system for making stored procedure programs available to application
2 programs, comprising:
3 means for determining one stored procedure program generating output needed by one
4 application program;
5 means for generating a remote interface implementation to respond to a remote
6 interface method capable of receiving a call from the application program including data and
7 invoking a stored procedure in a database server with the data from the application program
8 used as input; and
9 means for generating an output mapping for the remote interface implementation to use
10 to determine how to insert the stored procedure output into a data object that may be used by
11 the application program.

1 28. The system of claim 27, wherein the generated remote interface implementation
2 inserts metadata into the data object providing information on the stored procedure output
3 inserted into the data object.

1 29. An article of manufacture for enabling access to data by:
2 receiving a call from a client to invoke a remote interface method;
3 accessing, with a remote interface implementation, parameters from the received call in
4 response to the invocation of the remote interface method;
5 generating a stored procedure call with the accessed parameters as input parameters of
6 the stored procedure;

1 transferring the stored procedure call to a stored procedure named by the call to
2 execute;
3 receiving output from the stored procedure;
4 inserting the received output from the stored procedure into a data object; and
5 returning the data object to the client.

1 30. The article of manufacture of claim 29, wherein the stored procedure executes
2 in a database server and generates the output, wherein the output is capable of comprising
3 output that is a member of the set of output comprising one or more result sets of data from the
4 database table and one or more output parameters resulting from stored procedure operations
5 performed on data in the database table.

1 31. The article of manufacture of claim 29, further comprising processing, with the
2 remote interface implementation, an input mapping to determine the parameters in the client call
3 to use as input parameters to the stored procedure call.

1 32. The article of manufacture of claim 29, further comprising:
2 receiving the stored procedure output after the stored procedure program completes
3 execution.

1 33. The article of manufacture of claim 29, further comprising processing an output
2 mapping indicating how the stored procedure output is mapped to the data object.

1 34. The article of manufacture of claim 33, wherein the output is capable of
2 including result sets and parameters, wherein the output mapping indicates an order in which the
3 received result sets and parameters are added to the data object

1 35. The article of manufacture of claim 29, further comprising:
2 generating metadata describing the stored procedure output included in the data object;
3 and
4 adding the metadata to the data object.

1 36. The article of manufacture of claim 35, further comprising:
2 processing, with the client, the metadata in the received data object to determine how
3 to access the stored procedure output from the data object.

1 37. The article of manufacture of claim 35, wherein the data object is comprised of
2 multiple elements, wherein the stored procedure output includes rows of data from at least one
3 result set, wherein inserting the stored procedure output into the data object further comprises
4 inserting data from each column in each row in each result set to one element in the data object,
5 and wherein the metadata defines structure and types of data in each element.

1 38. The article of manufacture of claim 35, wherein the data object is comprised of
2 multiple elements, and wherein the stored procedure output is capable of including multiple
3 output parameters, wherein inserting the stored procedure output into the data object further
4 comprises inserting each output parameter into one element in the data object, and wherein the
5 metadata provides information on structure and type of the data in each element.

1 39. The article of manufacture of claim 29, wherein the client only receives one data
2 object with stored procedure output in response to the call.

1 40. The article of manufacture of claim 29, wherein the remote interface
2 implementation is implemented as a Enterprise JavaBean and wherein the data object
3 comprises a Java serializable object.

1 41. An article of manufacture for making stored procedure programs available to
2 application programs by:
3 determining one stored procedure program generating output needed by one
4 application program;
5 generating a remote interface implementation to respond to a remote interface method
6 capable of receiving a call from the application program including data and invoking a stored
7 procedure in a database server with the data from the application program used as input; and
8 generating an output mapping for the remote interface implementation to use to
9 determine how to insert the stored procedure output into a data object that may be used by the
10 application program.

1 42. The article of manufacture of claim 41, wherein the generated remote interface
2 implementation inserts metadata into the data object providing information on the stored
3 procedure output inserted into the data object.